



The medicinal use of marijuana:

the history, therapeutic potential and legal landscape in South Australia

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The medicinal use of marijuana for people living with HIV/AIDS in South Australia

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Darling House
64 Fullarton Road
Norwood, SA 5067
Reception: (08) 8334 1611
Toll Free: 1800 888 559
Facsimilie (08) 8363 1046
Email: information@acsa.org.au
Website: www.acsa.org.au

Written by Richard Cannon, Senior Policy Analyst, AIDS Council of South Australia.

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GLOSSARY OF ACRONYMS

ACSA	AIDS Council of South Australia
AIDS	Acquired Immunodeficiency Syndrome
HIV	Human Immunodeficiency Virus
LGBTI	Lesbian, Gay, Bisexual, Transgender and Intersex
MSM	Men who have sex with men
PLWHA	People living with HIV/AIDS
SSA	Same Sex Attracted
STI	Sexually Transmissible Infection

GLOSSARY OF TERMS

Cannabis	There are three species of cannabis: cannabis sativa, cannabis indica and cannabis ruderalis. Cannabis sativa is the species cultivated for marijuana, hashish and hash oil as it contains a higher concentration of THC (Johns, 2004).
Cannabinoid	Any of the organic substances, such as THC, that are found in cannabis (marijuana), (The American Heritage Dictionary of the English Language, 2009, Cancer Council of New South Wales, n.d.).
Cannabinol	Is one of the 61 cannabinoids found in the cannabis plant. Cannabinol (CBN), (Johns, 2004).
Hemp	The dried leaves of the female flowers of the cannabis plant, which contain concentrations of THC and can be smoked or chewed to obtain a euphoric effect (Online Dictionary, n.d.).
Marijuana	The dried leaves and flowers (heads) of the cannabis sativa plant. Marijuana can be smoked either fashioned into a cigarette (joint) or smoked with a pipe or water pipe (bong) (Johns, 2004).
THC	Refers to D9-Tetrahydrocannabinol which is the primary psychoactive constituent in marijuana (Kennen, 2009).

Purpose

The purpose of this report is to investigate the use of medicinal marijuana/cannabis for the relief of symptoms associated with HIV infection in Australia. Australian and overseas research will be reviewed and a discussion will occur examining the efficacy and appropriateness of cannabinoid use in the treatment of pain and body wastage in people living with HIV.

This report does not seek to provide commentary regarding the recreational use of marijuana/cannabis in South Australia.

Introduction

Cannabis has been used as a therapeutic 'herbal' remedy for thousands of years and had been utilised in the Western world for the same purpose up until relatively recently. The allure of using herbal remedies such as marijuana/cannabis faded by the dual actions of advances in synthetic medicines and growing criminalisation of marijuana in national and international jurisdictions.

Since this time, the use of marijuana for medicinal use in the relief of symptoms of chronic illness has been hotly debated in Australia and in other jurisdictions (Corless, et al, 2009). Much of this debate has been fuelled by the legal status of the drug and public perceptions both about the drug itself and the people who consume it. Further, as marijuana has been used primarily as a recreational drug, the therapeutic nature of cannabinoids and the potential of the properties contained within it to treat acute illness is not as well known or accepted. As a result, much more is known about the side effects of cannabinoids rather than their effectiveness in treatments (Working party on the use of cannabis for medical purposes, 2000)

While there is a relative dearth of comprehensive studies and Australian trials into the efficacy and appropriateness of medicinal marijuana/cannabis, current evidence suggests that this treatment assists people living with HIV/AIDS (and other chronic conditions) to better manage both the pain that is caused by associated conditions as well as assisting them in reducing body wastage.

In light of the available evidence, many international jurisdictions have embraced the potential health benefits of marijuana/cannabis and have since decriminalised the medicinal use for those who meet strict criteria. Many people who have used these programs laud the positive effects on both their physical health but also their psychological health. And while available evidence overwhelmingly suggests that positive health benefits ensue from the use of marijuana/cannabis, no Australian government has moved to explore the issue more fully or to decriminalise medicinal marijuana for specialised groups.

The current use of marijuana/cannabis in Australia

According to recent national figures (shown in Table 3 below) the drugs most accepted by and utilised by Australia's population are the legal (licit) drugs, alcohol and tobacco. While tobacco use is slowly declining across the population, alcohol use is increasing slowly across the Australian population. Marijuana/cannabis is the next most popular and accepted drug used in Australia, despite the illicit nature of its access, possession and use. Interestingly, despite its popularity and similarly to tobacco use, marijuana/cannabis use is also declining across the Australian population, with figures indicating that there has been a decline of 3.6% nationally in marijuana/cannabis use (Australian Institute of Health and Welfare, 2008).

Table 3: Abridged summary of recent drug use: proportion of the population aged 14 years or older, Australia, 1993 to 2007

Drug/behaviour	1993	1995	1998	2001	2004	2007
	(Per cent)					
Tobacco	29.1	27.2	24.9	23.2	20.7	19.4
Alcohol	77.9	78.3	80.7	82.4	83.6	82.9
<i>Illicit drugs</i>						
Marijuana/cannabis	12.7	13.1	17.9	12.9	11.3	9.1
Heroin	0.2	0.4	0.8	0.2	0.2	0.2
Meth/amphetamine/speed	2.0	2.1	3.7	3.4	3.2	2.3
Ecstasy	1.2	0.9	2.4	2.9	3.4	3.5
Injecting drugs	0.5	0.6	0.8	0.6	0.4	0.5

Source: Australian Institute of Health and Welfare, (2008).

Correspondingly, the numbers of individuals who have ever tried/used drugs throughout their lifetimes shows that tobacco and alcohol to be the most frequently tried drugs with marijuana/cannabis the third most tried used drug in Australia (Shown in Table 4 below).

Table 4: Abridged summary of drugs ever used/tried: proportion of the population aged 14 years or older, Australia, 1993 to 2007

Drug/behaviour	Ever tried(a)			Ever used(b)		
	1993	1995	1998	2001	2004	2007
Tobacco	50.9	47.4	50.8	49.4	47.1	44.6
Alcohol	88.0	87.8	89.6	90.4	90.7	89.9
<i>Illicit drugs</i>						
Marijuana/cannabis	34.7	31.1	39.1	33.1	33.6	33.5
Heroin	1.7	1.4	2.2	1.6	1.4	1.6
Meth/amphetamine/speed	5.4	5.7	8.8	8.9	9.1	6.3
Ecstasy	3.1	2.4	4.8	6.1	7.5	8.9
Injecting drugs	1.9	1.3	2.1	1.8	1.9	1.9

Source: Australian Institute of Health and Welfare, (2008).

(a) tried at least once in lifetime

(b) used at least once in lifetime

These figures suggest that the numbers of people who use licit drugs (such as tobacco and alcohol) are still quite significant with approximately 20% of the population smoking tobacco and just over 80% consuming alcohol. In contrast, figures surrounding illicit drug use suggest that around 10% of the population have tried marijuana/cannabis in their lifetimes and around a third of the population indicating they have used marijuana/cannabis in the six months prior to the study. As an aside, the numbers of individuals reporting the use of other illicit drugs within this study was also quite low (Australian Institute of Health and Welfare, (2008).

Clearly the relatively high levels of use (though declining) and levels of community sentiment towards marijuana/cannabis makes it one of the least socially disapproved of and widely used illicit drugs in Australia (Gates, et al, 2009).

The use of marijuana/cannabis and the law in South Australia

While both regular and occasional use of marijuana/cannabis is significant, particularly when compared to other illicit drugs, the illicit nature of marijuana/cannabis smoking/possession still carries with it sanctions and civil/criminal penalties. Currently the legal approach in South Australia in regards to possession of marijuana/cannabis is one of 'prohibition with civil penalties' (White, et al, 2009). Essentially this means that possession and use of marijuana/cannabis is illegal in South Australia but 'offenders' can usually avoid contact with the criminal justice system for minor offences (White, et al, 2009). Current laws in South Australia regarding marijuana/cannabis possession, use and cultivation are divided into expiated and non-expiated offences, as follows (Drug and Alcohol Services of South Australia, 2006);

Expiable Offences (Simple Cannabis Offences)

Simple offences involving the personal possession and use of cannabis by adults can be dealt with under the 'Cannabis Expiation Notice scheme' (with the discretion of attending police officers). This scheme allows police to issue on the spot fines to people found in possession of small amounts of marijuana/cannabis. Individuals escape further prosecution if the expiation notice is paid within the prescribed time period (Drug and Alcohol Services of South Australia, 2006, White, et al, 2009). The expiable offences and associated penalty structure is as follows:

Table 5: Expiable offences

Offence	Amount	Expiation
Possession of cannabis	Less than 25grams	\$150
	25grams or more but less than 100grams	\$300
Possession of cannabis resin	less than 5 g	\$150
	5grams or more but less than 20grams	\$300
Smoking or consumption of cannabis or cannabis resin in a private place	n/a	\$150
Possession of equipment for smoking or consumption of cannabis or cannabis resin	If sole offence	\$150
	if accompanied by another possession, smoking or consumption offence	\$30
Cultivation of cannabis plants	One plant (provided the cannabis is for the grower's own use)	\$300

Source: Drug and Alcohol Services of South Australia, (2006)

This raft of expiation notices can only be issued to adults (18 years and over). As indicated earlier, if an individual fails to pay their expiation notice by the due date then they may face criminal prosecution where an automatic conviction for the cannabis offence will be recorded against them (Drug and Alcohol Services of South Australia, 2006).

Table 6 (shown below) details the non-expiable offences in which an individual faces a criminal conviction for marijuana/cannabis use in South Australia.

Table 6: Non-Expiable Offences

Offence	Amount	Expiation
Smoking or consumption in a public place	n/a	Maximum fine of \$500 and is accompanied by a criminal conviction.
Personal possession	involving 100 grams or more of cannabis or 20 grams or more of cannabis resin	maximum fine of \$500*
Cultivation of any artificially enhanced** cannabis plants	n/a	a maximum fine of \$500*
All offences relating to cannabis oil	n/a	A penalty not exceeding \$2000 or 2 years imprisonment or both.
Driving under the influence of an intoxicating Liquor or Drug as to be incapable of exercising effective control of the vehicle	n/a	<p>First Offence:</p> <ul style="list-style-type: none"> • fine of not less than \$700 and not more than \$1200; or • imprisonment for not more than 3 months; and • licence disqualification of not less than 12 months <p>Subsequent offence:</p> <ul style="list-style-type: none"> • fine of not less than \$1500 and not more than \$2500; or • imprisonment for not more than 6 months; and • licence disqualification of not less than 3 years

Source: Drug and Alcohol Services of South Australia, (2006)

*dependent on whether the offender can convince the court that the cannabis was for personal use only and not for sale or supply.

**'artificially enhanced cultivation' refers to the use of hydroponics (growing plants in a solution of water and nutrients) for the cultivation of the cannabis plant.

While the 'decriminalisation' of marijuana/cannabis in South Australia has been the impetus for much debate over the years, particularly when the laws were implemented, it must be acknowledged that as civil penalties (attached to criminal penalties for non-compliance or more serious offences) still apply to the possession of marijuana/cannabis, the term 'decriminalisation' can be viewed as a misnomer (Single, et al, 2000).

Since the inception of the CEN in 1987 the number of offences for marijuana/cannabis possession rose from 6,000 in 1987 to 17,000 in 1993/94. This marked rise was due to the 'net widening' effect of the scheme rather than any increases in cannabis use amongst the South Australian population. Interestingly, since 1987 the rates of expiation notices have remained quite low at around 50% (Single, et al, 2000).

Finally, while Table 3 (on page 9) shows a decline in the number of people 'recently' using marijuana since 1998, previous criminalisation and the more recent expiation schemes adopted in most states and territories has not created a substantial decrease in people utilising marijuana/cannabis nationally (Single, et al, 2000).

The historical use of marijuana/cannabis for medical use

The use of marijuana/cannabis for medicinal purposes is not a recent phenomenon and the properties of the cannabis plant have been used in medicine and for personal use for thousands of years (Degenhardt and Hall, 2008, Pertwee, 2006). Evidence suggests that cannabis was used in ancient China where it was recommended by physicians to relieve the pain associated with gout, stomach complaints, constipation, malaria and the pain associated with child birth. Early physicians were also cognisant of the effectiveness of the application of cannabis as an effective appetite enhancer (Griffith and Swain, 1999). The popularity of cannabis spread throughout Asia and the Middle East through to the eastern coast of Africa where cannabis was used in religious celebrations and as a relaxant to aid in the relief of stress amongst Hindu populations (Stack and Suddah, 2009). By the 18th Century, American medical journals were recommending the use of hemp seeds and the roots of cannabis plants in the treatment of anything from incontinence and skin complaints to the treatment of STIs. William O'Shaughnessy, who was an Irish physician renowned for his work in pharmacology and fresh from his studies in the use of cannabis in aiding medical complaints in Calcutta, was instrumental in introducing medical marijuana/cannabis to England and America. O'Shaughnessy lauded the abilities of cannabis to aid in the relief of the debilitating effects of rheumatism, as well as useful in the discomfort and nausea caused by rabies, tetanus and cholera (Stack and Suddah, 2009).

By the 20th Century, the advent of better synthetic drugs and a reliance and trust upon these new pharmaceuticals saw the gradual reduction of the use of marijuana/cannabis and other herbal remedies for medicinal purposes. Nevertheless, cannabis remained on the British Pharmaceutical Codex (which was a list of registered and approved drugs) until 1954 when it was removed as an approved drug. Shortly after, the use of cannabis was outlawed altogether (for both medical and personal purposes) in the United Kingdom by 1973 (Griffith and Swain, 1999). Conversely the use of cannabis in the USA was prohibited much earlier with the introduction of sanctions for possession and use in 1914 (subsequent to the establishment of the Food and Drug Administration) (Griffith and Swain, 1999). In Australia prohibition occurred in stages prompted by both the Hague Convention (1911-12) and the Geneva Convention of 1925 which provided the foundation of Australia's early drug laws. The use of opium, morphine, heroin, cocaine and cannabis were added to a list of prohibited substances in all but medical uses. In 1926, the Commonwealth passed the *Customs Trading Act 1901(Cth)*, which sought to control the importation of cannabis until an absolute prohibition of cannabis was introduced across the nation in 1956 (Griffith and Swain, 1999).

Since this time the use of marijuana has been illegal in Australia with varying degrees of sanctions attached to its use and possession. The illicit nature of marijuana has led much of society to view it as a largely unknown, mystical substance and therefore view the use either recreationally or medically with suspicion. This approach has not been helpful in facilitating a dialogue about the efficacy of marijuana/cannabis as a treatment option for people with chronic illnesses (Nature, 2001).

The evolution of medical marijuana/cannabis

Historically, the use of medical marijuana principally was administered by smoking, but over the last 40 years there have been pharmacological advances in the way that cannabinoids are utilised for medicinal purposes (Kennen, 2008, Pertwee, 2006).

Cannabinol was the first of the plant cannabinol's to be discovered from a red oil extract of the cannabis plant at the end of the 19th Century. From this discovery, the chemical structure of the plant was revealed in the early 1930's and from that a synthetic chemical structure was developed in the USA in the 1940's. Cannabidiol (CBD) was isolated shortly afterwards (Pertwee, 2006). Following on from these discoveries, THC was first isolated from the cannabis plant in 1942 and together with CBD were synthesised in 1963 (CBD) and 1964 (THC) (Pertwee, 2006).

While pharmacological experiments with the early cannabinoids occurred as early as the 1940's/50's, it was the 1960's and 1970's that saw testing of cannabinoids increase markedly. These experiments and trials were spurred on at the time by a virtual explosion of marijuana/cannabis use amongst young people in particular across the Western world (Pertwee, 2006).

In the mid 1980's it was discovered that cannabinoid receptors exist within the human body and that THC was able to bind to these receptors to either act with them or block them (Pertwee, 2006, Kennen, 2008). The two receptors are known as CB1 and CB2 receptors. CB1 receptors are located primarily in the brain and CB2 receptors are located primarily in the immune cells, (Kennen, 2008). With the discovery of the cannabinoid receptors within the body, the development of synthetic cannabinoids that influence these receptors took place in the 1980's/1990's (Pertwee, 2006).

Cannabinoids have been used successfully since these discoveries (in those regions where cannabinoid treatment is legalised, similarly to its use in ancient times) to reduce pain and discomfort in people with debilitating diseases and conditions such as cancer (the nausea and vomiting caused by chemotherapy), multiple sclerosis (the muscle spasticity associated with MS and epilepsy) and the neuropathic pain and body wastage associated with HIV/AIDS and cancer (Seamon, et al, 2007).

Currently there are two forms of medicinal cannabinoids used in reducing pain in people living with HIV while also stimulating the appetite. These are smoked marijuana and oral tetrahydrocannabinol (THC, dronabinol and marinol). The difference between each is significant. Oral THC is considered safe, is delivered in standardised doses but has a slow onset (peak effects in around 120 minutes). However, due to this slow onset, users find it difficult to regulate the dose to achieve the required effect. Conversely, smoked marijuana has a relatively rapid onset and its effects can be felt almost immediately (Seamon, et al, 2007), with peak effects felt in users in around 20 minutes (Haney, et al, 2005). The cannabinoid travels from the lungs to the blood stream and to a number of the body's organs expeditiously (Seamon, et al, 2007) and as such, users can more closely regulate the dose that is necessary to deliver the required effect (Haney, et al, 2005).

Cannabinoids that are currently on the market in the USA and Europe include;

- HU-211 (Dexanabinol) which is used to treat endotoxic shock¹, ischemia² and head trauma.
- Dronabinol (Marinol) is a cannabinoid prescribed as an appetite enhancer primarily for people who have HIV/AIDS, people being treated with chemotherapy and gastric bypass patients.
- Nabilone (Cesamet) is a synthetic copy of THC that is used to treat pain and nausea.
- Sativex is a nasal spray that is used to alleviate neuropathic pain and spasticity in multiple sclerosis patients.
- Rimonabant which is an appetite suppressant used to *decrease* the appetite in marijuana smokers (Kennen, 2008).

Cannabinoids are not currently registered for medicinal use in Australia and presently, smoked marijuana cannot be legally prescribed by doctors, nor legally obtained by individuals (Hall, 2001, cited in Fogarty, et al, 2007).

The therapeutic benefits of marijuana/cannabis use for people living with HIV

In spite of the fact that marijuana/cannabis is still illegal in most jurisdictions (both nationally and internationally) its use in alleviating pain and symptom management would appear to be quite widespread (Woolridge et al, 2005). The British Medical Association (1997, cited in Woolridge et al, 2005) speculated that perhaps many thousands of normally law abiding citizens across the developed world were using marijuana/cannabis for therapeutic reasons. The actual numbers of PLWHA that utilise marijuana/cannabis to treat HIV related symptoms is a difficult number to quantify (based principally upon self disclosure of an illegal activity) but some research reports have sought to shed light on these numbers. For example, in a study undertaken in California, of the 442 responders to the survey, 33.3% (147) reported the use of marijuana/cannabis for therapeutic purposes (Sidney, 2001).

¹ Endotoxic shock is the septic shock created by the release of bacteria in the body.

² Ischemia describes a condition where insufficient blood flow is able to reach the brain.

It has been reported that those people who use marijuana/cannabis recreationally in the short-term indicate improved moods, sensory experiences, creativity, increased socialising, experiences of euphoria (elation) and changes in appetite (Fogarty, et al, 2007). Further, as has been previously elucidated, there is evidence that medicinal marijuana/cannabinoid use aids in reducing pain and other health effects associated with illnesses and conditions such as cancer, multiple sclerosis, epilepsy, the treatment of glaucoma and secondary conditions related to HIV/AIDS (Johns, 2004). According to research, the reported benefits of marijuana/cannabinoid use include the following;

- The control of nausea and vomiting
- The control of muscle spasticity and anti-convulsant effects
- Pain management
- Increasing appetite
- Bronchodilation (asthma treatment) (Griffith and Swain, 1999, Johns, 2004, Klein, 2005, Fogarty, et al, 2007).

For individuals living with HIV or experiencing AIDS related conditions, medicinal marijuana/cannabis has been found to be particularly effective in managing the pain associated with these illnesses and conditions as well as in preventing HIV/AIDS related wasting (Haney, et al, 2005, Fogarty, et al, 2007, Corless, et al, 2009, Johns, 2004). This is also illustrated in the results from the study conducted by Woolridge et al (2005) shown below as Table 7 on the next page;

Table 7: Effect of Cannabis on Complaint of Symptoms in 143 HIV Patients

Symptom	Number of complaints	% Responding				
		Much better	Little better	No change	Little worse	Much worse
Lack of appetite	111	79	18	2	0	1
Pain in muscles	65	63	31	6	0	0
Nausea	62	56	37	3	2	2
Anxiety	98	64	29	3	2	2
Nerve pain	53	51	40	9	0	0
Depression	94	56	30	9	4	1
Tingling	46	37	48	9	7	0
Numbness	42	36	36	24	5	0
Weight loss	62	45	24	31	0	0
Headaches	46	35	30	33	2	0
Tremor	24	37	29	21	13	0
Constipation	24	21	29	46	4	0
Tiredness	60	17	33	33	15	2
Diarrhoea	48	13	23	56	6	2
Vision dimness	22	9	27	55	9	0
Weakness	48	10	21	54	15	0
Memory loss	38	13	5	34	34	13
Slurred speech	9	11	0	78	11	0

Source: Woolridge (et al, 2005)

The study (results shown above) surveyed 143 HIV-positive participants who reported using cannabis to assist in managing their pain and other symptoms. Participants showed significant improvement in symptoms such as neuropathic pain, loss of appetite, nausea, anxiety, depression, anxiety, tingling, numbness, weight loss, headaches, tremor, constipation and tiredness. The symptoms identified that were not improved by the use of cannabis were slurred speech and weakness while a significant proportion of users (47%) identified increased levels of memory deterioration.

The next section explores two of the main benefits of cannabinoids for people living with HIV/AIDS.

Nausea and appetite stimulation

While current antiviral therapies have been instrumental in significant reductions in HIV/AIDS related wasting and fatalities, a considerable number of people living with HIV/AIDS find maintaining a normal weight problematic (Haney, et al, 2004). Wasting is defined as the involuntary loss of more than 10% of normal body weight in addition to at least 30 days of diarrhea, fever or generalised weakness. It is considered that losing just 5% of normal body weight can have deleterious effects on the autonomic nervous system and general health and wellbeing (Haney, et al, 2004). Part of the rapid weight lost is body fat but more importantly individuals often go on to lose muscle (The Body: The Complete HIV/AIDS Resource, 2007). HIV/AIDS wasting is caused by several factors;

Low food intake due to a loss of appetite

A loss of appetite or a low appetite is common amongst people with HIV/AIDS. The side effects of antiretroviral drugs can include nausea which can exacerbate a low calorie intake. Further, infections in the mouth, throat and/or stomach also act to reduce the amount of food and nutrients absorbed by the body (The Body: The Complete HIV/AIDS Resource, 2007).

Low nutrient absorption

For PWLHA, infections, including parasites can interfere with the absorption of nutrients that normally takes place in the small intestine. Further, secondary conditions such as diarrhea can flush the system of much needed nutrients and calories (The Body: The Complete HIV/AIDS Resource, 2007).

Changed metabolism

As suggested earlier, the assimilation of food and nutrients of PWLHA is altered due to changes to the immune system caused by the presence of the virus. Immediate changes in energy output can be instigated by the presence of the virus and energy output may outstrip levels of food intake. PWLHA often require additional calories to maintain their normal body weight (The Body: The Complete HIV/AIDS Resource, 2007).

Several studies indicate that marijuana/cannabis use not only aids in nausea, constipation and diarrhea in PWLHA but also significantly assists in increasing calorie intake (Woolridge et al, 2005). Historically, marijuana/cannabis smoking has been associated in a period of increased hunger and calorie intake anecdotally known as the 'munchies'. THC has a well documented role in stimulating hunger in users of marijuana/cannabis (ScienceDaily, 2005) and this principle is utilised by PWLHA to stimulate hunger to increase both appetite and calorie intake. For example, Woolridge et al, (2005) cite in the results from their survey of 143 PLWHA that cannabis aided in the increase of appetite in 97% of participants.

Relaxation and pain reduction

PLWHA report various forms of pain such as neuropathic pain and muscular pain related to their infections. The symptoms are most often described as 'aching', 'burning' and 'painful numbness' usually confined to the legs or periphery such as hands and feet (Abrams et al, 2007). Anti-convulsant drugs have been shown to be effective in some people in treating this pain but they are not the panacea for all and have been found to be less effective or intolerable in others (Abrams et al, 2007, Woolridge et al, 2005). However, many PLWHA have found marijuana/cannabis to have increased efficacy in treating this pain. This is due to the anti-inflammatory and analgesic³ characteristics of marijuana/cannabis, which has shown clinical and anecdotal efficacy in treating pain disorders such as migraines, gastrointestinal pain (Seamon, et al, 2007) and the nerve pain (neuropathy) that is caused by HIV (Vann, n.d.).

In both animal and human studies, cannabinoids have been shown to inhibit the experience of pain. This was demonstrated in a study conducted by Ware, et al, 2003 (cited in Fogarty, 2007) in which individuals reported relief from pain after ingesting oral THC. Similarly in a study conducted in 2003 (Prentiss, et al, 2003, cited in Fogarty, et al 2007) some PLWHA indicated that they had experienced moderate relief from using marijuana for therapeutic reasons. In a further study undertaken recently in California, a double blind⁴, placebo controlled trial in which smoked marijuana/cannabis was tested in its role in reducing the analgesia associated with HIV neuropathic pain showed positive results. In the participants who consumed

³ Pain reducing properties

⁴ Is a procedure in which neither the people undertaking the experiment nor the participants know the critical aspects of the experiment. This form of testing is used to ensure against both bias and corrupted placebo effects (WordNet 3.0, n.d.).

the medical marijuana/cannabis (as opposed to the placebo), improvements to daily mood and functioning improved through a reduction in pain. Overall, the study found that smoked marijuana/cannabis was mostly well-tolerated and effective (when used concomitantly with analgesic therapy) to reduce the neuropathic pain caused by HIV/AIDS (Ellis, et al, 2008). Likewise, the Woolridge (et al, 2005) study demonstrated that 94% of participants reported positive results for muscular pain management using marijuana/cannabis while positive indicators for other categories of pain were also demonstrated. Finally, in another randomised, placebo controlled study undertaken in California in 2007, it was found that a 30% reduction in chronic pain was reported by 52% (vs. 24% in the placebo group) of the smoked cannabis group with a 72% reduction in pain felt after the first marijuana/cannabis cigarette (vs. 15% in the placebo group) (Abrams et al, 2007).

In general, PLWHA have reported that relaxation is a benefit from both therapeutic and recreational uses of marijuana/cannabis. Individuals indicate that effects from marijuana/cannabis use can include reductions in stress, relief from anxiety as well as an aid to improve sleep patterns, which, in turn reduces the psychological and physiological affects of insomnia (Fogarty, et al, 2007, Seamon, et al, 2007).

The adverse effects of cannabinoids: implications for future use

All drugs can have side effects and dangers of use and this applies to licit and illicit drugs (Bihari, 2008). Marijuana/cannabinoids have shown both anecdotally and empirically that they have a place and function to reducing pain and assisting in ameliorating other symptoms of chronic illnesses (Griffith and Swain, 1999, Johns, 2004, Klein, 2005, Woolridge et al, 2005, Fogarty, et al, 2007). However, several researchers have warned about the negative effects of prolonged use of cannabinoids, particularly smoked marijuana and how the effects of this treatment may eventually outweigh the positive benefits.

One of the major concerns highlighted through research for marijuana/cannabis smokers is the effects in the long term use on the cardiovascular, respiratory and nervous systems (Corless et al, 2009, Ware et al, 2006, Haney, et al, 2005, Seamon et al, 2007, Degenhardt et al, 2008, Wang et al, 2008). Seamon (et al, 2007) asserts that marijuana can contain 50%-70% more carcinogenic properties than cigarette smoke and can lead to several forms of cancer as well as respiratory illnesses. Further pulmonary effects reported by people who use marijuana/cannabis include; tachycardia⁵, hypertension⁶, hypotension⁷, palpitations, syncope⁸ and other pulmonary and respiratory conditions (Seamon et al, 2007).

The prolonged use of marijuana/cannabis has been reported to increase the incidences of other substance use (Ware et al, 2006, Seamon et al 2007), criminal activity, behavioural problems, reduced academic performance, suicidality (Ware et al, 2006) as well as users of cannabinoids thought to be impaired much like alcohol in the commission of driving or using heavy machinery (Ware et al, 2010,).

Heavy marijuana use has also been implicated in psychological dysfunctions including loss of memory and an inability to focus one's mind. In some people marijuana use has also resulted in paranoia, anxiety, depression and changes in mood (Seamon et al, 2007, Ware et al, 2006). Psychiatric effects have also been highlighted with a connection established between marijuana/cannabis smoking and the precipitation of psychotic symptoms amongst people vulnerable to such psychotic indicators (Degenhardt et al, 2008, Corless et al, 2009). However, the data that informs this link is comprised of recreational users so it is difficult to ascertain how medicinal marijuana/cannabis will impact upon therapeutic users in the longer term (Degenhardt et al, 2008). Nonetheless, and with the preceding evidence in mind, one study that reviewed the last 40 years of published studies into the safety and efficacy of cannabinoids (including oral, synthetic forms) found that the use of cannabinoids in the longer term posed no significant risk to users and the chance of minor adverse health events was minor.

Potential dependence on medicinal marijuana/cannabis has also been mooted as a side effect of cannabinoid treatment although this is yet to be established convincingly through research. Currently the only available data on the issue of dependence on marijuana/cannabis, much like the evidence supporting the link between marijuana/cannabis smoking and developing psychosis, is mainly centred on recreational users who have been smoking marijuana since early adolescence (Degenhardt et al, 2008).

5 Accelerated heart beat

6 High blood pressure

7 Low or reduced blood pressure

8 Loss of consciousness (fainting)

With much of the evidence surrounding side effects of marijuana/cannabis use based on studies mostly involving recreational users, there are calls for more comprehensive studies of people who are using marijuana/cannabis for medicinal use to determine more accurate short and longer term side effects of this treatment (Degenhardt et al, 2008).

Medicinal marijuana/cannabis use in other jurisdictions

Recently, several international jurisdictions have commissioned studies into the efficacy of cannabis as a treatment for pain relief in acute illnesses. Countries such as; Belgium, Germany, France, Switzerland, the Netherlands, the United Kingdom, the US and Australia have all explored the use of medicinal marijuana/cannabis and most have reported that cannabinoids have significant therapeutic benefits (Fogarty, et al, 2007). Many of these jurisdictions have also legalised marijuana/cannabis in one form or another and patients are able to access marijuana/cannabis to lessen the symptoms of chronic illnesses. The following explores the experience and legislative change that has occurred in three separate jurisdictions that have decriminalised MM for chronic illness.

United States of America

The process of legalisation of medicinal marijuana/cannabis began in 2005 when a pilot program involved three Californian counties in August of 2005 (California Department of Public Health, 2009). The program then expanded statewide with a ruling that medicinal marijuana be decriminalised by 1996. Since then dozens of US states have followed suit and decriminalised medicinal cannabinoids (Stack and Suddah, 2009). In California, the use of medicinal cannabinoids and the Medicinal Marijuana Program (MMP) was provided for through Senate Bill 420 (Chapter 875, Statutes of 2003), to make clear the requirements of Proposition 215, of the *Compassionate Use Act of 1996*. This revision enabled the development and implementation of a medical marijuana identification card program which assisted eligible individuals and their caregivers to access medicinal cannabinoids (California Department of Public Health, 2009).

The new provisions in the *Compassionate Use Act of 1996* were designed to ensure that only chronically ill individuals and their carers were able to access medicinal marijuana/cannabis for medical purposes. A physician is needed to determine whether an individual would benefit from the use of marijuana/cannabis where that medical use is deemed appropriate in the treatment of chronic and debilitating illnesses such as (Californian Department of Public Health, 2010);

- HIV/AIDS
- Cancer
- Arthritis
- Anorexia
- Chronic pain
- Spasticity
- Glaucoma
- Migraine and other illnesses in which MM may bring relief (Californian Department of Public Health, 2010).

The individual can then voluntarily apply for an identification card through the Californian Department of Public Health and then they are able to access personal amounts of marijuana/cannabis which means that a patient or caregiver cannot possess more than 8 ounces of dried marijuana/cannabis and grow no more than six mature or 12 immature cannabis plants (Johns, 2004). The total cards issued since the programs inception in 2003 is 37,236 (California Department of Public Health, 2009).

However, authorities have come under fire in the California for the unwitting developments surrounding decriminalisation and the industry that has been spawned around medicinal marijuana. Under Californian law, licensed collectives can grow and distribute the marijuana (in small amounts, to holders of prescriptions and for personal use only) and shop fronts can also distribute medicinal marijuana to holders of prescriptions. The distributors are told that they can ask for a donation for the marijuana/cannabis but they are not permitted to make a profit. The trouble has ensued from unscrupulous operators selling marijuana to

those other than legitimate prescription holders and selling for a profit. There has been speculation from some operators that doctors are setting up offices in California where they make their living by writing prescriptions for medicinal marijuana. This has led to the federal government (who under George W. Bush refused to accept California state law) attacking the program and the industry. These attacks have ceased since President Obama took office which has, in turn caused a resurgence of operators (Sydney Morning Herald, 2009).

Table 8: A summary of the main features of the Californian MM program

Administration	California Department of Public Health
Physician role	To determine eligibility and to recommend patient access the program
Eligible health conditions	<ul style="list-style-type: none"> • HIV/AIDS • Cancer • Arthritis • Anorexia • Chronic pain • Spasticity • Glaucoma • Migraine • Other illnesses
Access	Patients access the marijuana/cannabis through licensed collectives and shop fronts.
Other conditions	Patients must receive a prescription from a physician to access marijuana/cannabis

Canada

In 1999, several years before the US, the Ontarian Court of Appeal ruled that it was unconstitutional to enforce a rule of law in regards to cannabis. Subsequent to this ruling, the possession of cannabis for authorised patients in Canada became legal from 2001. Approval for access to medicinal marijuana/cannabis is undertaken by the Marijuana Medical Access Regulations (MMAR). The MMAR stipulate rigid regulations for the use of medical marijuana and prescriptions can only be made within strict parameters (Ware et al, 2006). Patients can access medicinal marijuana/cannabis if they have been diagnosed with the following conditions/diseases;

- HIV/AIDS
- Cancer
- Multiple Sclerosis
- Spinal cord injury/disease
- Severe arthritis
- Epilepsy
- Or as part of a palliative care treatment program
(Medical Marijuana Information Resource Centre, 2010).

When an individual is deemed eligible to receive medicinal marijuana/cannabis by the MMRS, they are then known as a 'licensed patient' who has three legal choices in obtaining their medicinal marijuana (Medical Marijuana Information Resource Centre, 2010);

- **Obtain medical marijuana/cannabis from Health Canada** - individuals are able to purchase their standardised medicinal marijuana from Health Canada.
- **Grow medical marijuana/cannabis at home for personal use** – individuals are able to apply for a

license to legally grow their own medicinal marijuana/cannabis at their own homes.

- **Develop a relationship with a personal supplier** – licensed patients are able to have a third party grow a personal supply of medicinal marijuana for them at a secure location (Medical Marijuana Information Resource Centre, 2010).

Up until 2006, 1492 people had been authorised to access medicinal marijuana⁹ and just over 900 physicians had assisted individuals to make applications under this scheme (Ware et al, 2006).

Canada’s program is more tightly controlled than California’s and as such many of the issues that have befallen the US experience have not occurred in Canada. However, there have been issues surrounding cannabis clubs (much like the Californian model) who have been supplying patients with medicinal marijuana when this action is not provided for under legislation. As such these clubs have been raided by police and club owners have faced prosecution (Johns, 2004).

Table 9: A summary of the main features of the Canadian MM program

Administration	Health Canada
Physician role	To determine eligibility and to recommend patient to the Marijuana Medical Access Regulations (MMAR)
Eligible health conditions	<ul style="list-style-type: none"> • HIV/AIDS • Cancer • Multiple Sclerosis • Spinal cord injury/disease • Severe arthritis • Epilepsy • Or as part of a palliative care treatment program
Access	<ul style="list-style-type: none"> • Purchase directly from Health Canada. • Apply to grow cannabis plants at home • Licensed patients can have a third party grow a personal supply of medicinal marijuana for them at a secure location
Other conditions	Patients must become licensed by the MMRS to access marijuana/cannabis

The Netherlands

While it was still classed as illegal, Dutch law has been lenient regarding the personal use of marijuana over the last 40 years, and there are estimations that before the Netherlands Government legalised medicinal marijuana/cannabis in 2003 there were 10,000 individuals who illegally obtained and used cannabis for medicinal reasons (Janse et al, 2004). The government hoped that by legalising medicinal marijuana/cannabis (recreational marijuana/cannabis use is still illegal) they would remove the need for chronically ill individuals to access the drug illegally and the illicit cannabis market would decrease. Authorities also wanted to ensure the purest and most appropriate supplies of the drug would be provided to eligible people.

This decriminalisation has provided medical grade standardised doses of marijuana/cannabis to be prescribed to patients living with cancer, anorexia and PLWHA. In a study of patients and physicians prescribing marijuana/cannabis, good or excellent results were elucidated by respondents (64.1% out of the 107 participants) (Gorter et al, 2005).

The use of medicinal marijuana/cannabis is facilitated much like Canada through physician prescriptions filled at a pharmacy. The medical grade marijuana/cannabis is provided to the pharmacy by ‘Maripharm’ which is a patient based non-profit organisation charged by the government with growing medical grade marijuana for people with chronic illnesses. The doses are standardised, sterile and vacuum packed with a THC content of 10.2% (Gorter et al, 2005).

⁹ The marijuana is supplied as ‘herbal cannabis’ which is cultivated under controlled conditions, free from contaminants and disease causing bacteria and is sold to patients for \$5 per gram (Ware et al, 2006).

There were concerns, as in the other jurisdictions that legalising medicinal cannabinoids would lead to increases in other uses of marijuana/cannabis across the Netherlands. However, in a study undertaken in 2004 it was found that cannabis use not increase dramatically for respondents but in fact the legalisation of medicinal cannabinoids lead to decreases in concomitant illicit drugs in survey participants (Janse et al, 2004). According to Johns (2004) what did increase was number of ‘coffeeshops’ in the Netherlands which specialise in allowing people to consumer marijuana/cannabis on the premises. The notion behind the ‘coffeeshop’ was to separate young people in particular who wished to consume marijuana/cannabis from other hard drugs and the illegal drug trade. By 1997 there were almost 1200 across the country with the government reducing the numbers down to 813 by the 2000.

Table 10: A summary of the main features of the Netherlands MM program

Administration	Bureau voor Medicinale Cannabis (Office of Medicinal Cannabis)
Physician role	To determine eligibility and to recommend patient access the program
Eligible health conditions	<ul style="list-style-type: none"> • HIV/AIDS • Cancer • Multiple Sclerosis • Tourette’s Syndrome • Chronic pain • Spasticity
Access	Patients access the MM through pharmacies, buyers clubs and cooperatives
Other conditions	Patients must voluntarily apply through the Department of Public Health to join the program and be issued with an identification card.

The way forward

Marijuana/cannabis is the third most popular drug (behind the licit drugs of alcohol and tobacco) and as such has become the most accepted and widespread of all of Australia’s illicit drugs. Much of society is familiar with the recreational uses of marijuana/cannabis and assumptions, beliefs and stigma have developed around this often mysterious substance. However, the therapeutic uses of cannabinoids have been acknowledged and promoted for thousands of years in Eastern cultures as well as been scientifically tested in the Western world over the last Century.

The legal landscape in South Australia is one of ‘decriminalisation’ of marijuana/cannabis for personal use but authorities still enforce either civil or criminal sanctions on users dependent on a raft of factors. The irony of the criminalisation of marijuana/cannabis is that the two licit drugs, alcohol and tobacco are responsible for a significant proportion of deaths in Australia and contribute negatively to both state and federal budgets in the mitigation of health issues related to their use. In addition, other ‘legal’ psychotropic medications such as anti-depressants are also freely prescribed when we know that these drugs can have major side effects that sometimes impact negatively on users (Johns, 2004).

Unfortunately opposition to the advancement of marijuana/cannabis as a therapeutic medication (despite evidence of its efficacy in treating pain and discomfort in chronic illness) has opposition within the community firmly ensconced within anachronistic political, legal and religious notions based upon the assumption that if we legalise marijuana, the other drugs will follow (Johns, 2004).

Clearly, as the paper has demonstrated, there is evidence that positive health benefits can be attained by the use of cannabinoids by people with chronic illnesses. However, without political support, further research, clinical trials and the development of medical grade, standardised doses of cannabinoids, PLWHA and people with other debilitating conditions are left with little choice but to self medicate with non-medical grade marijuana/cannabis. Therefore the ‘underground’ and unregulated nature of self administration by smoking marijuana/cannabis will continue in South Australia.

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